CLAIMS

1. A method of mounting at least two optical components in optical alignment on a shared substrate, the method comprising the steps of:

i) using a planar fabrication technique to determine the distance between an optical axis and a bonding surface in at least one of the optical components so that said distance is matched for optical alignment in use of the at least two optical components; and

ii) flip chip mounting said at least one of the optical components in said optical alignment on the shared substrate by means of its bonding surface.

2. A method according to Claim 1 wherein said method comprises the step of flip chip mounting at least two of the optical components in optical alignment with each other.

3. A method according to Claim 2 wherein said shared substrate provides a planar bonding surface for said flip chip mounting of the at least two of the optical components in optical alignment with each other.

4. A method according to Claim 2 wherein said shared substrate provides a non-planar bonding surface for said flip chip mounting of the at least two of the optical components in optical alignment with each other.

5. A method according to Claim 1 wherein at least one of the at least two optical components comprises a laser diode.

6. A method according to Claim 1 wherein at least one of the at least two optical components comprises a planar waveguide.

7. A method according to Claim 1 wherein said planar fabrication technique to determine the distance comprises the provision of a spacing layer of material of predetermined depth.

8. A method according to Claim 7 wherein the spacing layer comprises a hybrid glass material.

9. An optical assembly comprising:

i) at least first and second optical components, each having an optical confinement region and an optical axis in use, and at least the first optical component having a bonding surface ; and

ii) a shared substrate,

wherein the first component is mounted on the shared substrate by means of its bonding surface and the first and second components are supported by the shared substrate such that their respective optical confinement regions are optically coupled in use,

and wherein at least the first component comprises a spacing layer which determines the distance from the bonding surface to the optical axis for the first component to achieve said optical coupling in use.

10. An assembly according to Claim 9 wherein the shared substrate provides a planar surface on which both said first and second components are mounted to achieve said optical coupling in use.

11. An assembly according to Claim 9 wherein the second optical component has a bonding surface and both the first and the second components are mounted on the shared substrate by means of their bonding surfaces.

12. An assembly according to Claim 11 wherein the distance from the bonding surface to the optical axis for the first component is different from the distance from the bonding surface to the optical axis for the second component, the shared substrate providing a non-planar surface on which both said first and second components are mounted to achieve said optical coupling in use.

13. An assembly according to Claim 12 wherein said non-planar surface is provided by a glass material having both organic and inorganic components.

14. An optical assembly according to Claim 11 wherein the distance from the bonding surface to the optical axis for the first component is matched to the distance

from the bonding surface to the optical axis for the second component to an accuracy of 300 nm or less.

15. An optical assembly according to Claim 11 wherein the distance from the bonding surface to the optical axisfor the first component is matched to the distance from the bonding surface to the optical axisfor the second component to an accuracy of 100 nm or less.

16. An optical assembly according to Claim 9 wherein said spacing layer comprises a glass material having both organic and inorganic components.

17. An optical assembly according to Claim 9 wherein the spacing layer provides the whole distance between the bonding surface and the optical confinement region.

18. An optical assembly according to Claim 9 wherein the spacing layer provides only part of the distance between the bonding surface and the optical confinement region.

19. An optical assembly according to Claim 16 wherein the glass material comprises an inorganic matrix provided at least in part by a metal alkoxide or salt that has been hydrolysed.

20. An optical assembly according to Claim 19 wherein the metal alkoxide or salt comprises one based on groups 3A, 3B, 4B and 5B of the Periodic Table.

21. An optical assembly according to Claim 19 wherein the glass material comprises an organic component to modify the inorganic matrix.

22. An optical assembly according to Claim 21 wherein the glass material is adapted to be processed at temperatures of more than or equal to 400°C.

23. An optical assembly according to Claim 21 wherein said glass material comprises a thermal- or photoinitiator to initiate polymerisation in the glass material for use in lithographic processing.

24. An optical assembly according to Claim 21 wherein the glass material is adapted to be processed at temperatures of not more than 200°C.

25. An optical assembly according to Claim 21 wherein the glass material is adapted to be processed at temperatures of not more than 150°C.

26. An optical assembly according to Claim 9 wherein at least one of the first and second components comprises a laser diode.

27. An optical assembly according to Claim 26 wherein the first component comprises a laser diode and the laser diode comprises semiconductor material selected from one or more of the III-V groups of the Periodic Table.

28. An optical assembly comprising at least first and second optical components mounted in optical alignment with each other, each component comprising at least one layer and a substrate and providing an optical confinement region in use, wherein the optical assembly further comprises a shared substrate, the first and second optical components each being mounted so that its optical confinement region lies between its respective substrate and the shared substrate.

29. An optical assembly according to Claim 28 wherein the shared substrate comprises a planar surface on which the first and second optical components are mounted.

30. An optical assembly according to Claim 28 wherein at least one of the first and second optical components comprises a spacing layer of material between the optical confinement region and the shared substrate, said spacing layer being of a depth to provide said optical alignment.

31. An optical assembly according to Claim 28 wherein the substrate comprised by the first component has different characteristics from the substrate comprised by the second component.

32. An optical assembly according to Claim 31 wherein the substrate comprised by the first component has a different depth from the substrate comprised by the second component.

33. An optical assembly according to Claim 9 wherein at least one of the first and second components is provided with an electrical connection by means of its bonding surface.

34. A method of mounting at least two optical components in optical alignment on a shared substrate, the method comprising the steps of:

i) using a planar fabrication technique to provide a support structure on a substrate, the support structure providing at least two support surfaces;

ii) flip chip mounting at least one of the optical components onto one of the support surfaces; and

iii) supporting at least a second of the optical components on a second of the support surfaces, in optical alignment with the at least one of the optical components.

35. An optical assembly comprising at least two components in optical alignment on a shared substrate, wherein an optical cladding layer of a first of the components and a support surface for a second of the components are each provided by areas of a layer fabricated on the shared substrate.

36. An optical assembly according to Claim 35 wherein the material of the fabricated layer comprises a hybrid glass material.

37. An optical assembly according to Claim 35 wherein the fabricated layer is discontinuous.